

# High Temperature Telemetry Transmitter for Venus Exploration, Phase I

Completed Technology Project (2005 - 2005)



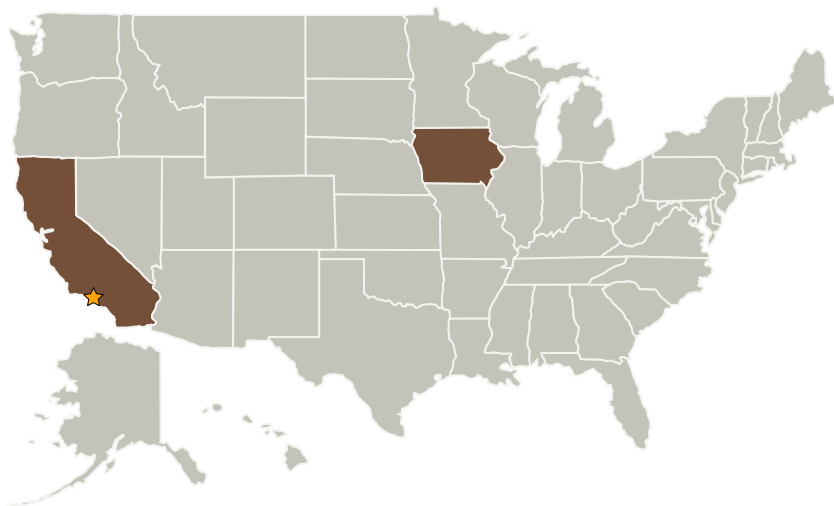
## Project Introduction

The proposed S-band telemetry transmitter will operate in the exterior Venusian corrosive, high pressure, 460

o

C ambient atmosphere without being contained in a thermally protective container. The sealed, radiation-hardened, high-reliability, silicon-carbide-based transmitter uses an ambient heatsink to cool its single high temperature transistor without the power, volume, and weight of auxiliary cooling. An innovative circuit architecture requires only one semiconductor device; other components are ceramic or temperature-compensated machined metal parts. Operating life on Venus is limited only by the external power source and acid erosion of the case; several months is anticipated. The transmitter accepts digital data and primary power in, and provides radio power out to its antenna. The transmitter's 10 watt RF output power to an integral omnidirectional antenna provides ample link margin for 50 kbps to a 2000 mile altitude relay satellite, and may be linearly scaled in power, data rate, and/or range as desired. Our proposed solution includes the complete communications system design and analysis, including modulation, link power budget, receiver, and antenna. This solution can also be applied to very cold Titan-like applications as well.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
Softronics Ltd.	Supporting Organization	Industry	Cedar Rapids, Iowa

## Primary U.S. Work Locations

California	Iowa
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## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Robert Sternowski

## Technology Areas

**Primary:**

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - └ TX05.1 Optical Communications
    - └ TX05.1.3 Lasers